ORAL ARGUMENT NOT YET SCHEDULED

No. 22-1080

Consolidated with Nos. 22-1144 and 1145

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

NATURAL RESOURCES DEFENSE COUNCIL,

Petitioner,

v.

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION, et al.,

Respondents.

On Petition for Review
of Action of the National Highway Traffic Safety Administration

PROOF BRIEF OF PETITIONER NATURAL RESOURCES DEFENSE COUNCIL

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CERTIFICATE AS TO PARTIES, RULINGS, AND RELATED CASES

Pursuant to Circuit Rule 28(a)(1), the undersigned counsel provides the following information for all consolidated cases.

A. Parties and *Amici curiae*

Petitioners

In case number 22-1080, petitioner is the Natural Resources Defense Council.

In case number 22-1144, petitioners are the States of Texas, Arkansas, Indiana, Kentucky, Louisiana, Mississippi, Montana, Nebraska, Ohio, South Carolina, and Utah.

In case number 22-1145, petitioner is American Fuel & Petrochemical Manufacturers.

Respondents

In all consolidated cases, respondents are the National Highway Traffic Safety Administration; Ann Carlson, in her official capacity as Acting Administrator, National Highway Traffic Safety Administration; the United States Department of Transportation; and Pete Buttigieg, in his official capacity as Secretary, United States Department of Transportation.

Intervenors

In case numbers 22-1144 and 22-1145, petitioner-intervenors are Clean Fuels Development Coalition; Diamond Alternative Energy, LCC; ICM, Inc.; Illinois Corn Growers Association; Kansas Corn Growers Association; Kentucky Corn Growers Association; Michigan Corn Growers Association; Minnesota Soybean Growers Association; Missouri Corn Growers Association; Texas Corn Producers Association; Wisconsin Corn Growers Association; and Valero Renewable Fuels Company, LLC.

In case numbers 22-1144 and 22-1145, respondent-intervenors are Environmental Defense Fund; Environmental Law & Policy Center; National Coalition for Advanced Transportation; Natural Resources Defense Council; Public Citizen; Sierra Club; Union of Concerned Scientists; Zero Emission Transportation Association; the States of California, Colorado, Connecticut, Delaware, Hawaii, Illinois, Maine, Maryland, Michigan, Minnesota, Nevada, New Jersey, New Mexico, New York, North Carolina, Oregon, Vermont, Washington, and Wisconsin; the Commonwealths of Massachusetts and Pennsylvania; the District of Columbia; the City and County of Denver; and the Cities of Los Angeles, New York, and San Francisco.

Amici Curiae

No individuals or entities have, as of yet, sought to participate as amicus curiae.

B. Ruling Under Review

Petitioner challenges an action of the National Highway Traffic Safety Administration published as "Corporate Average Fuel Economy Standards for Model Years 2024-2026 Passenger Cars and Light Trucks" at 87 Fed. Reg. 25,710 (May 2, 2022).

C. Related Cases

On July 1, 2022, this Court consolidated Case Nos. 22-1144 and 22-1145 with this case. *See* Order, *NRDC v. NHTSA*, No. 22-1080 et al., Dkt. No. 1953265 (D.C. Cir.).

TABLE OF CONTENTS

TABLE OF AUTHORITIES

Cases

Statutes

Other Authorities

GLOSSARY

CAFE	Corporate Average Fuel Economy
NHTSA	National Highway Traffic Safety Administration
NRDC	Natural Resources Defense Council

INTRODUCTION

The Energy Policy and Conservation Act requires that motor vehicle fuel economy standards be set at the maximum feasible level. To that end, the Act directs the National Highway Traffic Safety Administration to review the state of vehicle technology and project how automakers can improve the fuel economy of their fleets. If technology exists to improve fuel economy at a reasonable cost, the Act requires the agency to set the highest standards achievable with that technology.

To assess the feasibility of more stringent fuel economy standards, the agency uses a computer model that projects the cost of adding efficiency technologies to new vehicles. The agency first prepares a "menu" of available technologies. The model then surveys the menu and, starting with the most cost-effective upgrade, adds technologies to vehicles until the fleet's average fuel economy reaches given targets. The technologies that are available for the model to consider are thus critical to the agency's assessment of the costs of future standards.

When the agency set its most recent standards, however, it arbitrarily excluded cost-effective technologies—so called high-compression-ratio or "Atkinson-enabled" engines—from its compliance

modeling for light trucks (pickups and sport utility vehicles). As a result, the agency set standards below the mandated "maximum feasible" level. Atkinson technologies are highly effective in cars. Light trucks, the agency asserted, are bigger and usually operate at high load (*e.g.* towing), so the technology must not provide any benefit.

The record, however, says otherwise. Light trucks are mostly used to ferry passengers and small payloads around. Atkinson-enabled engines are designed with these uses in mind. During the routine driving that dominates a truck's daily use, these engines operate in a higher efficiency mode. When more power is needed on occasion, such as for towing, these engines automatically switch to a higher power mode.

Moreover, the technology has been in use in light trucks since 2016, starting with the Toyota Tacoma, the best-selling mid-size pickup in the country. Other automakers followed, and by 2020 were selling half a million light trucks each year with Atkinson technology. Based on the record facts, the technology could be much more widely used, and the agency's exclusion of the technology from its compliance modeling was arbitrary. The standards should be remanded to the agency to correct its errors and reconsider setting stronger standards.

JURISDICTIONAL STATEMENT

Petitioner Natural Resources Defense Council ("NRDC") seeks review of a final rule of the National Highway Traffic Safety Administration, published at 87 Fed. Reg. 25,710 (May 2, 2022). This Court has jurisdiction under 49 U.S.C. § 32909(a)(1). The petition for review was timely filed within 59 days of the rule's publication. *See id.* § 32909(b).

ISSUE PRESENTED

Whether the average fuel economy standards set for model years 2024–2026 were arbitrary, capricious, or contrary to law because the agency excluded from its assessment an effective, lower-cost technology that is in fact already in use on a significant number of vehicles.

STATUTES AND REGULATIONS

Pertinent statutes and regulations are reproduced in an addendum to this brief.

STATEMENT OF THE CASE

I. Congress Requires the Agency to Set Fuel Economy Standards at Maximum Feasible Levels

Motor vehicles use more petroleum by far than any other end-use sector in the nation. *See* U.S. Energy Info. Admin., *Use of Oil*,

https://www.eia.gov/energyexplained/oil-and-petroleum-products/use-of-oil.php. Congress long ago recognized that inefficient motor vehicles waste petroleum at significant cost to consumers and the national economy and security. Spurred by the energy crisis created by the 1973 Mideast oil embargo, Congress enacted the Energy Policy and Conservation Act, Pub. L. No. 94–163, 89 Stat. 871 (1975). The Act "established a major program to bring about improved motor vehicle fuel efficiency," including "mandatory vehicle fuel economy standards, intended to be technology forcing . . . [and] strong enough to bring about the necessary fuel conservation which a national energy policy demands." *Ctr. for Auto Safety v. NHTSA*, 793 F.2d 1322, 1324, 1339 (D.C. Cir. 1986) (citations omitted).

These corporate average fuel economy standards—often called "CAFE standards"—set performance standards of miles traveled per gallon of fuel used. *Id.* at 1324. Each automaker "must achieve *an average* level of fuel economy" across their new vehicles manufactured in a given model year." *Id.*

The Act distinguished between "passenger" vehicles (*i.e.*, cars) and "light trucks" such as sport utility vehicles and pickups. *Id.*[1] In 2002, in response to a request from Congress, the National Academy of Sciences published a report on the fuel economy program. *See Ctr. for Biological Diversity v. NHTSA*, 538 F.3d 1172, 1184 (9th Cir. 2008). The Academy found that the envisioned distinction "between a car for personal use and a truck for work use/cargo transport" had "been stretched well beyond the original purpose." *Id.* (quotations omitted). The "less stringent" standards for light trucks had incentivized automakers to invest in those vehicles "and to promote them to consumers in place of large cars and station wagons." *Id.* As time went on, consumers were using light trucks "primarily for passenger-carrying purposes." *Id.* at 1208.

Whereas "light truck" sales were only about 20 percent of the new vehicle market at the advent of the fuel economy program, they accounted for about 50 percent by the early 2000s. *Id.* at 1184. "As the

[1] The term "light trucks" is a term of art, referring to the non-passenger car vehicles regulated under 49 U.S.C. § 32902 including pickups, minivans, and larger sport utility vehicles. *See Ctr. for Auto Safety*, 793 F.3d at 1324. It does not include actual "work trucks," which are larger trucks regulated separately. *See* 49 U.S.C. § 32901(a)(19).

market share of light trucks [increased], the overall average fuel economy of the new light duty vehicle fleet . . . declined." *Id.* (quotations omitted).

In 2007, Congress revitalized the fuel economy program with the Energy Independence and Security Act, Pub. L. No. 110-140, 121 Stat. 1492 (2007). Congress required the National Highway Traffic Safety Administration ("NHTSA," or "the agency") to set an average fuel economy standard for cars and a separate average fuel economy standard for light trucks. 49 U.S.C. § 32902(b)(3)(A).[2] These two standards must be set at "the maximum feasible average fuel economy level" for each model year of new vehicles. *Id.* § 32902(a), (b)(2)(B).

In determining the feasibility of more stringent standards, Congress directed the agency to consider four factors: "technological feasibility, economic practicability, the effect of other motor vehicle standards of the Government on fuel economy, and the need of the United States to conserve energy." *Id.* § 32902(f). To ensure NHTSA has current information about "technologies and costs" to improve fuel

[2] The statute tasks the Secretary of Transportation, who delegated it to NHTSA. *Ctr. for Auto Safety*, 793 F.2d at 1324 n.10; 49 C.F.R. § 1.94(c).

economy, Congress required the agency to contract with the National Academy of Sciences to periodically assess the state of "existing and potential technologies that may be used practically to improve [motor vehicle] fuel economy." Pub. L. No. 110-140, § 107, 121 Stat. at 1504.

II. The Agency in 2016 Finds Atkinson Engines "One of the Most Promising" Technologies for Fuel Economy Gains

In 2012, NHTSA prescribed average fuel economy standards for model years 2017–2021. 77 Fed. Reg. 62,624 (Oct. 15, 2012). The agency also announced a further set of "'augural' standards for model years 2022 to 2025 based on its current best judgment" of feasible future improvements. *See California v. EPA*, 940 F.3d 1342, 1346 (D.C. Cir. 2019) (cleaned up).

In 2015, the National Academy of Sciences reported to NHTSA that "[s]everal manufacturers are developing or producing engines with exceptionally high compression ratios." JA___[2015_NAS_Report_69]. High-compression-ratio technologies (also called "Atkinson" technologies) improve fuel efficiency by making an engine's compression stroke (which "compresses" the gasoline and air in the engine before it is ignited) shorter than its expansion stroke (which captures the energy from igniting the gasoline and delivers it to the vehicle's wheels). *See* 87

Fed. Reg. at 25,786 & n.213–n.216. The logic of an Atkinson engine is that by allowing a longer expansion stroke, more work can be extracted from each unit of fuel combusted, thus improving fuel efficiency. *See id.*

Early Atkinson engines achieved some of their efficiency gains at the expense of power or torque, JA___[2011_NAS_Report_14], and early uses were primarily in passenger cars, JA___[2015_NAS_Report_70]. But, in 2015, the Academy reported that Toyota had "announced that the issue with low torque ha[d] been overcome," and that "this development [was] expected to facilitate the application of Atkinson cycle engines" in more vehicles. JA___[2015_NAS_Report_70–71].

In 2016, NHTSA and other expert agencies jointly published a 1,200-page draft technical assessment report on motor vehicle technologies. *See* 81 Fed. Reg. 49,217 (July 27, 2016). "The agencies found that a wider range of technologies exist[ed] for manufacturers to use to meet [model year] 2022–2025 standards, and at costs that [were] similar or lower, than those projected" in 2012. *California*, 940 F.3d at 1347 (cleaned up).

In particular, the 2016 report described high-compression-ratio Atkinson engines as "one of the most promising non-electrified

technologies capable of playing a major role in compliance with [standards] through 2025." JA___[NHTSA-2016-0068-001_12-35]. The report noted that "nearly all" hybrid vehicles in the nation used Atkinson engines, and that multiple automakers had introduced Atkinson engines on conventional vehicles since 2012. JA___[NHTSA-2016-0068-001_5-31]. Although most previous applications had been on passenger cars, the report noted that starting with model year 2016, Toyota had introduced an Atkinson engine on the Tacoma, the best-selling mid-size pickup truck in the country. JA___[NHTSA-2016-0068-001_5-31–5-32]. Equipped with this engine, the report observed, the Tacoma pickup was rated to tow up to 6,800 pounds. JA___[NHTSA-2016-0068-001_5-32].

III. The Agency in 2017 Shelves Its Own Research and Stalls Fuel Economy Standards

Notwithstanding NHTSA's 2016 technical findings that a wider range of cost-effective technologies existed to meet the previously announced augural 2025 standards, the agency slammed on the brakes in 2018 under the Trump administration. NHTSA proposed to find that it was infeasible for automakers to make *any* improvement in average

fuel economy in any of model years 2021 to 2026. *See* 83 Fed. Reg. 42,986, 42,986 (Aug. 24, 2018).

The agency also reversed direction on Atkinson engines. The agency now proposed to consider the technology infeasible except for limited applications on smaller passenger cars. *See, e.g.*, 83 Fed. Reg. at 43,038. With virtually no explanation, the agency claimed that "the technology is not suitable for many vehicles due to performance, emissions, and packaging issues," and was "not suitable" in "many cases" for vehicles with "6-cylinder engines." *Id*. The notice of proposed rulemaking did not address the fact that 6-cylinder engine vehicles like the best-selling Tacoma pickup *already* used Atkinson technologies.

NRDC and other stakeholders commented that Atkinson engines were already in use on vehicle types that NHTSA proposed to consider incapable of using Atkinson engines. *See* 85 Fed. Reg. 24,174, 24,409–24,413 (Apr. 30, 2020). These included "pickup trucks, performance sedans, all-wheel drive versions, four-wheel-drive versions, and mid-sized [sport utility vehicles]," including the 424-horsepower Lexus 450h sport utility vehicle. JA___[NHTSA–2018–0067–11741_21]. Commenters also observed that, if the proposed restrictions were

removed in the agency's compliance model, the model projected significant uptake of Atkinson technologies at a lower cost of compliance—indicating that the model correctly treated Atkinson engines as "highly cost-effective technology." *See* 85 Fed. Reg. at 24,426.

NHTSA finalized standards in 2020 without correcting its erroneous exclusion of Atkinson engines. *Id.* at 24,427. While compelled to acknowledge that Atkinson technologies were already in use on current light truck models, the agency claimed that automakers had applied the technology "in unique ways" to those vehicles, that the technology was not suitable "for all vehicle configurations," and that the technology "may not" meet requirements for "high-load applications." *Id.* at 24,426. The agency did not explain the difference between trucks and sport utility vehicles that *were* using the technology and those that ostensibly could not. NHTSA suggested that, particularly for vehicles with 6-cylinder engines, there "may" be issues "on some platforms" to "package the larger exhaust manifolds needed." *Id.* Again, the agency did not explain how existing vehicles with 6-cylinder Atkinson engines had overcome this supposed issue in a manner that other 6-cylinder vehicles could not.

NHTSA also "agree[d]" that high-compression-ratio Atkinson engines were "highly cost-effective technology" and that incorporating this technology in its computer compliance model would significantly reduce the projected "per-vehicle cost of compliance" with higher standards. 85 Fed. Reg. at 24,426. But the agency nonetheless maintained that the exclusion of this technology was "appropriate." *Id.*

NRDC and others challenged these agency actions in this Court. Following the change in presidential administration in 2021, the agency announced it would reconsider its 2020 rule, and the litigation was placed in abeyance. *See* Order, *Competitive Enter. Inst. v. NHTSA*, No. 20-1145 et al., Dkt. No. 1892931 (D.C. Cir. Apr. 2, 2021).

IV. The Agency in 2021 Proposes to Strengthen Standards, But Still Excludes Atkinson Technologies from Consideration Despite Growing Real-World Use

In 2021, although NHTSA proposed to strengthen the do-nothing standards set under the prior administration, the agency continued to discount the real-world use of cost-effective Atkinson technologies. The agency analyzed several alternative stringencies for model years 2024–

2026,[3] 86 Fed. Reg. 49,602, 49,603 (Sept. 3, 2021), and proposed to adopt what it called "Alternative 2," *id.* at 49,611. It also sought comment on a more stringent alternative, "Alternative 3." *Id.* at 49,754.

Explaining its proposal in terms of the required statutory considerations, 49 U.S.C. § 32902(f), NHTSA determined that the more stringent Alternative 3 "best meets the need of the U.S. to conserve energy," 86 Fed. Reg. at 49,803. Alternative 3 "would save consumers the most in fuel costs," "would achieve the greatest reductions in climate [pollution]," and "would also maximize fuel consumption reductions, better protecting consumers from international oil market instability and price spikes." *Id.* NHTSA further concluded that Alternative 3 was "technologically feasible," *id.* at 49,810, and that it was also feasible after considering "other motor vehicle standards of the Government," *id.* The agency's choice to propose the less stringent alternative boiled down to its view that "the additional technology cost required" to meet Alternative 3 made these more stringent standards economically impracticable. *Id.*

[3] NHTSA concluded that statutory lead time requirements meant that 2024 was the earliest model year that could be amended in the fuel economy program. 86 Fed. Reg. at 49,603.

The agency's consideration of those costs, however, excluded the use of Atkinson technologies to improve the fuel economy of much of the light truck fleet. *Id.* at 49,661–49,662. NHTSA projected the additional technology cost of meeting stronger standards using a computer compliance simulation model (the "CAFE Model"). *See id.* at 49,632. The agency's compliance model is designed to project the most cost-effective way automakers could add technology to their fleets to meet prescribed standards. *Id.*

To make that projection, the model relies on agency-supplied inputs such as information about automakers' recent new vehicle offerings, a "menu" of possible technology combinations that an automaker could use to improve those vehicles' efficiency, and information about each technology's cost and effectiveness. *See id.* at 49,632.

For each automaker and each model year, the model surveys the "menu" and—starting with the most cost-effective technology option—adds technologies "based on their relative cost-effectiveness" until the automaker achieves compliance. *Id.* The model performs its calculations only on technologies NHTSA puts into the model and allows the model to select. *Id.*

Here, NHTSA *blocked* the model from selecting Atkinson-enabled engines as a fuel economy improvement option for *any* pickup truck and *any* vehicle that shares an engine with a pickup truck, which includes a wide range of sport utility vehicles and cars. *See* 86 Fed. Reg. at 49,661–49,662. In other words, even if the model would otherwise have identified an Atkinson-enabled engine as "the most cost-effective technology solution" available for these vehicles, JA__[CAFE_Model_Documentation_75_fig. 8] ("Compliance Simulation Algorithm"), the agency instructed the model to ignore that technology, forcing the model to move on to a less-cost-effective option. The result is to increase the estimated cost of complying with the potential standards. *See* 86 Fed. Reg. at 49,632 & n.39.[4]

The agency presented no rational explanation for excluding Atkinson engines in this way. NHTSA acknowledged that automakers had continued to deploy Atkinson engines on larger vehicles, and that "new observed applications in the market" included multiple 6-cylinder

[4] The agency also blocked its compliance model from considering Atkinson-enabled engines for "vehicles with 405 or more horsepower," and for all vehicles for three specific automakers "that are heavily performance-focused." 86 Fed. Reg. at 49,661–49,662.

vehicles such as the Hyundai Palisade and the Kia Telluride sport utility vehicles. *See id.* at 49,661 & n.130.[5]

The agency also acknowledged that automakers had developed engines that could "dynamically swing between operating [modes] based on engine loads." *Id.* at 49,658–49,659. These "Atkinson-enabled" engines could operate in a "power-dense" mode during high load operations like towing or hauling. *See id.* But during lower load conditions, "such as driving around a city or steady state highway driving without large payloads," the engine would automatically operate in a "higher-efficiency" mode (called "Atkinson cycle"). *See id.* at 49,659. "The hybrid combustion cycle operation is used to address the low power density issues that can limit the Atkinson-only engine and allow for a wider application of the technology." *Id.*

Nonetheless the agency still blocked its compliance model from using this technology on *all* "pickup trucks" and *all* "vehicles that share engines with pickup trucks." *Id.* at 49,661–49,662. The agency observed

[5] Some pickup trucks, such as the Chevy Colorado, have engines with *less* than 6 cylinders. JA___[Model_Files] (Central_Analysis/input/market_data_ref.xlsx, Vehicles_tab, Row 917, Column Z).

that "the level of efficiency improvement experienced by a vehicle employing an Atkinson-enabled engine is directly related to how much of the engine's operation time is spent at high Atkinson levels." *Id.* at 49,658. According to NHTSA, the "duty cycle" for pickups and sport utility vehicles, "particularly when hauling cargo or towing," would make these vehicles "likely unable to take full advantage of Atkinson cycle use." *Id.* at 49,662. Instead, such vehicles "would ultimately spend the majority of operation" in a less efficient operating mode. *Id.*

In other words, the agency did not contend that Atkinson-enabled engines were incapable of meeting these vehicles' power needs during towing or hauling. Instead, the agency apparently assumed that all pickup trucks—and all vehicles using pickup truck engines, including smaller sport utility vehicles and cars—would spend the "majority" of their time towing or hauling. But the agency presented no data on any of these vehicles' "duty cycles,"—*i.e.* how they are used in the real world—or any other data such as the percentage of these vehicles that are sold with tow hitches installed.

V. Commenters Highlight Real-World Data that Refutes the Agency's Premise for Excluding Atkinson Engines

NRDC and others submitted comments urging the agency to finalize more stringent standards. JA___[NHTSA–2021–0053–1572–A1]; JA___[NHTSA–2021–0053–1521–A2]; JA___[NHTSA–2021–0053–1581–A1]. Among other things, commenters noted that "the additional technology cost" for the more stringent Alternative 3, *see* 86 Fed. Reg. at 49,810, resulted in part from the agency's decision to block its compliance model from selecting highly cost-effective technologies such as Atkinson-enabled engines for millions of vehicles each model year. JA___[NHTSA–2021–0053–1572–A1_46–47]; JA___[NHTSA–2021–0053–1521–A2_4–9]; JA___[NHTSA–2021–0053–1581–A1_26–28].

While the agency purported to have "expanded" its consideration of Atkinson technologies compared to the 2020 Rule, 86 Fed. Reg. at 49,661, commenters observed that NHTSA had still blocked its compliance model from applying Atkinson-enabled engines "to the vast majority of engines with 6 or more cylinders." JA__[NHTSA–2021–0053–1521–A2_4–9]. Commenters noted that the number of vehicles with 6 or more cylinders that were already using Atkinson technologies

continued to increase in the real world. JA___[NHTSA–2021–0053–1521–A2_4–9].

Regarding NHTSA's claim that a pickup truck's "duty cycle" was too extreme to benefit from the efficiency gains of an Atkinson-enabled engine, commenters demonstrated that high load operations—such as towing or hauling heavy cargo—represent a small fraction of a pickup's uses. JA___[NHTSA–2021–0053–1521–A2_4–9]; JA___[NHTSA–2021–0053–1581–A1_26–28]. Commenters provided data that "75 percent of [pickup] truck owners use their truck for towing one time a year or less," such that the "large majority of pickup trucks spend the vast majority of driving at low loads relative to the engine's capability, where Atkinson cycle engines are very effective." JA___[NHTSA–2021–0053–1581–A1_26–28].

The point of Atkinson-enabled engines, commenters explained, was that they could "operate efficiently in Atkinson [mode] when possible," but automatically switch to "power" mode "when greater power density is required." JA___[NHTSA–2021–0053–1521–A2_4–9]. Commenters also noted that engines in pickups are sized to handle higher *peak* loads, and thus operate at lower loads relative to their maximum

capacity when not operating at that peak load. Given the data that pickups rarely operate near peak load, this means that pickups "will spend more time in Atkinson [mode] than lower performance vehicles . . . not less." JA___[NHTSA–2021–0053–1581–A1_26–28].

Commenters noted that market-leading light trucks were already offered with Atkinson technologies. In addition to the best-selling Toyota Tacoma mid-size pickup, commenters pointed to additional vehicles such as the popular Dodge Ram 1500 pickup, which was now available with Atkinson technologies installed. JA___[NHTSA–2021–0053–1521–A2_4–9]. Further, commenters pointed to existing complementary technologies that would further reduce vehicle load—such as the lighter-weight body construction of the all-aluminum Ford F-150 pickup—and enable even "broader Atkinson-cycle operation." JA___[NHTSA–2021–0053–1521–A2_4–9].

VI. NHTSA in 2022 Finalizes Standards That, While an Improvement, Still Arbitrarily Exclude Atkinson Engines as a Means to Improve Trucks' Fuel Economy

In 2022, the agency finalized standards slightly more stringent than proposed, but still significantly less so than Alternative 3. *See* 87 Fed. Reg. 25,710, 25,721 (May 2, 2022) ("Final Rule"). Commenters had

made "a credible case" that more stringent standards were feasible, *id.* at 26,003, as Alternative 3 was "technologically feasible," "maximizes energy conservation," and "result[s] in more [fuel] savings." *Id.* But the agency found Alternative 3 "slightly" beyond the level of economic practicability, with "per-vehicle costs, technology application rates, and lead time" "tip[ping] the balance" to a lower stringency. *Id.*

The compliance modeling NHTSA relied on for the final standards retained all the constraints on Atkinson-enabled engines to which commenters had objected. *See* 87 Fed. Reg. at 25,789–25,790 & n.234. The agency continued to block its model from applying relatively more cost-effective Atkinson technology to any "pickup trucks and vehicles that share engines with pickup trucks"; to any "vehicles with 405 or more horsepower"; or to any vehicles of three specific manufacturers that are "performance-focused" (BMW, Daimler, and Jaguar Land Rover). *Id.*[6] The agency had also made coding errors that led the model to erroneously block Atkinson technologies on other vehicles

[6] The agency also blocks electric hybridized versions of the technology on all these vehicles. *See* 87 Fed. Reg. at 25,812.

representing half-a-million new vehicle sales that the agency had not intended to exclude. *See* Section I.C, *infra*.

Notably, however, the justification for the pickup truck exclusion shifted from the proposal. In the Final Rule, the agency maintained the exclusion was based on the "duty cycle" of pickups, but it dropped the reference to the duty cycle involving frequent high-load operations such as towing. The agency now said that a pickup's "duty cycle" necessitates maintaining what it called "large torque reserves," a new concept the agency did not define.[7] To maintain these "reserves," the agency claimed, requires "an engine calibration that minimizes the advantage of Atkinson cycle use." 87 Fed. Reg. at 25,789.[8]

NHTSA did not explain why the vehicle's onboard computer could not be programmed to turn the Atkinson cycle on and off as appropriate.

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[7] Torque is a measure of present rotational force, *see Safe Extensions, Inc. v. Fed. Aviation Admin.*, 509 F.3d 593, 596 (D.C. Cir. 2007), so it is unclear what a reserve of that is.

[8] The advent of computerized engine control allowed for real-time optimization of engine operation. JA___[2011_NAS _Report_5] ("Computer control . . . now allows the dynamic optimization of engine operations, including precise air/fuel mixture control, spark timing, fuel injection, and valve timing."). The way an engine's computer is programmed to adjust engine operation under various conditions is sometimes called an engine's "calibration." 87 Fed. Reg. at 25,791.

The agency's stated basis for the exclusion was a confidential "conversation" with unnamed automaker(s) who stated they "saw no benefit" when Atkinson technologies were applied to truck platforms in their fleet. *Id*. at 25,789 n.233.

NHTSA acknowledged commenters' data that "[75] percent of [pickup] truck owners use their truck for towing one time a year or less." 87 Fed. Reg. at 25,790.[9] The agency also acknowledged comments that modern Atkinson-enabled engines could meet any need for additional power or torque by switching to a "power" mode (called "Otto cycle"). *Id*. The agency's only response was to assert that Atkinson-enabled engines are not able to "completely" achieve a "traditional" Otto mode, and that having the ability to switch modes "significantly improves the engine efficiency but does not give the engine the functional flexibility" suggested by commenters. *Id*. The only purported support the agency cited was selected automaker comments from 2018 on the *prior* rulemaking proposal, *id*. at 25,790–25,791, even though that proposal had not included the new notion of "torque reserves." The

[9] The Final Rule preamble text omits the number "75" as the percentage provided by commenters, but this is presumably a typo. The comment NHTSA is citing from is at JA___[NHTSA–2021–0053–1581–A1_27].

agency did not cite to any automaker comments from the current rulemaking in support.

NRDC petitioned this Court for review of the Final Rule. *See* Petition for Review, *NRDC v. NHTSA*, No. 22-1080, Dkt. No. 1946518 (D.C. Cir. May 11, 2022). The Court later consolidated NRDC's petition with two other petitions. *See* Order, *NRDC v. NHTSA*, No. 22-1080 et al., Dkt. No. 1953265 (D.C. Cir. July 1, 2022).

STANDARD OF REVIEW

This Court holds unlawful agency actions that are "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 5 U.S.C. § 706(2)(A), (C); *see Competitive Enter. Inst. v. NHTSA*, 45 F.3d 481, 484 (D.C. Cir. 1995) (applying arbitrary and capricious standard to review of fuel economy standards). "An agency action is arbitrary and capricious" if the agency "offered an explanation for its decision that runs counter to the evidence before the agency"; "ignore[d] evidence that undercuts [the agency's] judgment"; failed to "articulate a rational explanation for its actions"; or rested its action "upon a factual premise that is unsupported by substantial evidence." *Genuine Parts Co. v. EPA*, 890 F.3d 304, 312 (D.C. Cir. 2018) (cleaned up).

SUMMARY OF THE ARGUMENT

NHTSA arbitrarily excluded from consideration a fuel economy technology that is already available in commercial use, and as a result the agency did not set fuel economy standards at the "maximum feasible" level required by Congress. 49 U.S.C. § 32902(a). NHTSA rejected stronger fuel economy standards because it estimated that the cost of the necessary technology was "slightly" higher than the cost the agency considered appropriate for the standards to impose. But NHTSA's cost estimate was artificially high, because the agency failed to analyze the use of cost-effective Atkinson engines as a compliance option on millions of new vehicles sold each year.

The agency's reliance on its flawed compliance modeling was arbitrary and capricious for three independent reasons. First, NHTSA's decision to block its model from considering high-compression-ratio Atkinson-enabled engines for any pickup truck is not supported by the record. The agency relies on a conclusory and counter-factual assumption that pickups are routinely used in ways that are incompatible with Atkinson technology. But the record shows that consumers mostly drive pickups at lower load conditions, where

Atkinson-enabled engines are very efficient. The record also shows that automakers have already deployed Atkinson-enabled engines on pickups and other large vehicles. Moreover, NHTSA's *only* purported factual basis for the pickup truck exclusion is undisclosed. The agency says it had a confidential "conversation" with unidentified automaker(s) who persuaded the agency to block the technology. Even if secret data could theoretically trump the other record evidence (which it cannot), the agency's conclusory assertion—affecting more than a million pickup trucks sold *each year*—was insufficiently explained and thus still arbitrary and capricious.

Second, even if NHTSA could justify the exclusion for pickup trucks, the agency extended the exclusion to more than a million sport utility vehicles and cars that share engines with pickup trucks. This extension was independently arbitrary. There is no record evidence that these vehicles have duty cycles comparable to pickups, and NHTSA nowhere explains why automakers cannot feasibly upgrade these vehicles with Atkinson technologies. Any post-hoc attempt to justify extending the exclusion would be unlawful, and would fail in any event. Automakers have already deployed Atkinson technology on sport utility

vehicles and cars, and the record shows they could deploy it to many more vehicles.

Finally, the agency compounded its errors by erroneously blocking almost half a million other vehicles from being considered for Atkinson upgrades in the compliance model. The agency itself says these vehicles should have been considered.

Each of these three errors forced the agency's compliance model to potentially pick a relatively less cost-effective technology option, and thus arbitrarily overestimate the cost of compliance. The exclusions affect millions of vehicles sold each year, and the agency cannot rationally conclude that blocking Atkinson technologies in its model was immaterial. The Court should remand the rule to the agency, without vacatur, to correct these errors and reconsider the feasibility of more stringent standards.

STANDING

The Final Rule prescribes standards that are not the maximum feasible standards. NRDC's members are injured by the increased pollution and decreased availability of fuel-efficient vehicles traceable to the Final Rule. *See, e.g.*, 87 Fed. Reg. at 25,865–25,868 & n.617, 25,974

& tbl. VI-5, 25,808, 26,010 & tbl. VI-13. *Cf. Competitive Enter. Inst. v. NHTSA*, 901 F.2d 107, 112–113 (D.C. Cir. 1990) (consumers who experience a reduced opportunity to purchase certain types of vehicles have standing to challenge fuel-economy rules); *NRDC v. NHTSA*, 894 F.3d 95, 104–105 (2d Cir. 2018) (NRDC had standing to challenge NHTSA action based on increased automobile air pollution near members' homes); *NRDC v. Wheeler*, 955 F.3d 68, 76–78 (D.C. Cir. 2020) (NRDC had standing to challenge agency action based on increased climate-related emissions and effects on members). NRDC has members who want to purchase more-fuel-efficient vehicles whose availability the Final Rule will diminish; who live or work near oil refineries or major roadways where higher localized pollution will be experienced; and who have respiratory conditions that are exacerbated by the effects of climate change.[10] An order remanding the Final Rule to the agency with direction to correct the significant analytical errors that led to less stringent fuel economy standards will redress these injuries.

[10] Petitioner's standing declarations are reproduced in an addendum to this brief.

ARGUMENT

The agency made three errors that render its decision not to adopt more stringent standards arbitrary and capricious. The agency arbitrarily excluded high-compression-ratio Atkinson-enabled engines as a compliance option in its modeling for all pickup trucks. Section I.A, *infra*. The agency arbitrarily extended that exclusion to more than a million sport utility vehicles and cars sold each year. Section I.B, *infra*. And the agency arbitrarily blocked the technology on half a million other vehicles sold each year, even though the agency itself says these vehicles should be able to use the technology. Section I.C, *infra*.

Each error independently warrants a remand to the agency to reconsider the feasibility of stronger fuel economy standards. Because vacatur of the Final Rule would leave more lax standards in place, the Court should remand without vacatur. Section II, *infra*.

I. The Agency's Exclusion of Atkinson-Enabled Engines From Compliance Modeling was Arbitrary

As an initial matter, NHTSA irrationally treats some vehicles that have *already* adopted Atkinson technologies in the real world as if they had not. For example, the agency's compliance model treats the Tacoma pickup as if it does not have an Atkinson engine and blocks it from

having additional Atkinson technologies installed.[11] This effectively forces the model to assume the Tacoma will upgrade to an entirely different engine technology. The agency's counter-factual modeling "bears no rational relationship to the reality it purports to represent," *Columbia Falls Aluminum v. EPA*, 139 F.3d 914, 923 (D.C. Cir. 1998), and the resulting analysis is contrary to the evidence, *see Utility Solid Waste Activities Group v. EPA*, 901 F.3d 414, 432 (D.C. Cir. 2018).

As explained below, the agency's modeling of Atkinson technologies for new vehicles fares no better. At bottom, the agency has offered nothing but conclusory assertions that automakers cannot use Atkinson-enabled engines to achieve *any* fuel economy improvement in pickups and sport utility vehicles. Because the agency's mandate is to determine what automakers "can" do, 49 U.S.C. § 32902(a), the lack of reasoned explanation is even more glaring given the real-world examples of automakers deploying Atkinson technologies on pickups and large sport utility vehicles. *See, e.g.* 87 Fed. Reg. at 25,789 & n.230;

[11] JA___[Model_Files] (Central_Analysis/input/market_data_ref.xlsx, Vehicles_tab, *e.g.*, Row 1319, Column H; Engines_tab, Row 101, Columns AD–AF=SKIP).

JA___[NHTSA–2021–0053–1521–A2_4–9]; JA___[NHTSA–2021–0053–1581–A1_26–28].

A. The agency's "pickup truck exclusion" is unexplained and unsupported by the record

NHTSA's rejection of Atkinson-enabled engines was based on three assertions. First, the overarching assertion is that Atkinson technology is incompatible with the "duty cycle" of pickups, 87 Fed. Reg. at 25,789—*i.e.*, how they are used in the real world. Second, the agency asserts that every pickup's duty cycle requires something it calls "large torque reserves." *Id.* Third, based on confidential sources, the agency asserts that the only way to maintain such "reserves" is to calibrate every pickup engine in a way that cancels the entire efficiency benefit of Atkinson-enabled engines. *Id.* & n.233.

But there are no findings or reasoned explanations supporting the first two assertions. And the agency cannot rely on undisclosed confidential information to substantiate or explain the third, *see Flyers Rts. Educ. Fund, Inc. v. Fed. Aviation Admin.*, 864 F.3d 738, 745–748 (D.C. Cir. 2017), which in any event is contrary to the record. There is no "confidentiality loophole" in the "bedrock principle" that an agency must "articulate with clarity and precision its findings and the reasons

for its decisions." *In re NTE Connecticut, LLC*, 26 F.4th 980, 989 (D.C. Cir. 2022).

1. NHTSA's assumption about pickup truck duty cycles is contrary to the record

The agency starts by asserting that the exclusion is based on the "duty cycle" of pickup trucks. The agency never explains the duty cycle it thinks all pickups operate on, which is reason enough to find the assertion arbitrary. "Conclusory explanations" are insufficient, even in "highly technical" areas. *Genuine Parts Co.*, 890 F.3d at 312. But the record data also runs counter to any assertion that the way pickups are used in the real-world is incompatible with Atkinson-enabled engines.

In the proposal, the agency said it was "particularly when hauling cargo or towing" that a pickup's use was "likely" incompatible with Atkinson-enabled engines. 86 Fed. Reg. at 49,662. But the uncontradicted record evidence shows that most pickups operate at lower-load conditions, and thus can achieve increased efficiency with Atkinson technology. NHTSA acknowledged commenters' data that 75% of pickup trucks tow "one time a year or less." 87 Fed. Reg. at 25,790. The agency itself also cited several times to *Center for Biological Diversity v. NHTSA* (*see, e.g.*, 87 Fed. Reg. at 25,961 n.796), where the

Ninth Circuit cited a raft of evidence, including from National Academy of Sciences reports, that consumers "use light trucks primarily for passenger-carrying purposes." 538 F.3d 1172, 1207–1209 (2008).

The agency never disputed that pickups rarely tow heavy things. Instead, the agency simply dropped the reference to towing and hauling in the Final Rule. But the record facts remain that consumers do not primarily use pickups for high-load operations like towing, and NHTSA "cannot ignore evidence contradicting its position." *See Genuine Parts Co.*, 890 F.3d at 312. NHTSA had no *other* data about pickup truck "duty cycles." Any reliance on an unarticulated alternative duty cycle would simply be a blanket assumption about pickup truck usage without any rational support. This the agency cannot do. The agency must provide "some" factual support for its conclusion. *See Edison Elec. Inst. v. EPA*, 2 F.3d 438, 446 (D.C. Cir. 1993); *Safe Extensions, Inc.*, 509 F.3d at 605 ("[A]n agency's unsupported assertion does not amount to substantial evidence.").

2. NHTSA's claim that all pickups need "large torque reserves" is unexplained and unsubstantiated

In the Final Rule, NHTSA still premises the exclusion on the "duty cycle" of pickups. 87 Fed. Reg. at 25,789. But rather than rely on actual

duty cycle data, NHTSA claims that all pickups need "large torque reserves." *Id.* This change in label cannot justify a duty cycle-based exclusion.

As an initial matter, the agency never explains what "torque reserves" are, or why all the nearly million-and-a-half pickup trucks sold each year need them.[12] The phrase "torque reserves" did not even appear in the notice of proposed rulemaking, and it only appears twice more in the Final Rule preamble, both times restating the conclusion. *Cf.* 87 Fed. Reg. at 25,786 (Atkinson technology not beneficial for vehicles "that must maintain a high level of torque reserve"); *id.* (Atkinson technology more beneficial for vehicles with "lower relative need for torque reserves"). The agency may not root its explanation in an undefined concept that forces the Court to "guess at the theory underlying the agency's action." *See City of Vernon v. Federal Energy Regulatory Comm'n*, 845 F.2d 1042, 1048 (D.C. Cir. 1988) (quotation omitted).

[12] JA___[Model_Files] (Central_Analysis/input/market_data_ref.xlsx, Vehicles_tab, Columns V, H, Y, Engines_tab, Columns C, H, AD–AF).

NHTSA never provides any data on "torque reserves" or explains in even general terms what level of "torque reserves" would satisfy these vehicles' needs. The agency only says they must be "large." But that explains nothing. *See Tripoli Rocketry Ass'n, Inc. v. Bureau of Alcohol, Tobacco, Firearms, & Explosives*, 437 F.3d 75, 81 (D.C. Cir. 2006) (classification based on a material burning "much faster" than another was arbitrary). The agency also never explains how "torque reserves" are measured in order to be assessed for "largeness." NHTSA must provide "*some* metric for classifying" torque reserve needs, and its failure to do so renders the technology exclusion arbitrary. *See id*. Even "in the face of uncertainty" the agency "must exercise its expertise" and "hazard a guess." *See Chamber of Commerce v. S.E.C.*, 412 F.3d 133, 143 (D.C. Cir. 2005).

The record shows that Atkinson-enabled engines are designed with a pickup's actual duty cycle in mind—ready to provide additional power and torque on the infrequent occasions it is needed. During routine driving, the engine operates in the higher-efficiency mode enabled by the Atkinson technology; when it tows, the engine's computer *automatically* switches to "power" mode. *See* 87 Fed. Reg. at 25,786.

NHTSA never explains why a computer-controlled Atkinson engine cannot provide sufficient torque by switching automatically to "power" mode. The agency contends only that the engines cannot switch "completely" out of Atkinson efficiency mode, *id.* at 25,790, but again fails to explain the level of power that *is* achieved and why that level is insufficient. *See Tripoli Rocketry*, 437 F.3d at 81.

In short, neither the agency's invocation of duty cycles, nor the agency's invention of "torque reserves," provide any explanation for the exclusion. An agency must always "cogently explain why it has exercised its discretion in a given manner." *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 48 (1983).

3. NHTSA's claim that all pickups need an inefficient engine calibration is unexplained and unsubstantiated

The agency's last attempt to justify the pickup truck exclusion is simply to assert that maintaining the required torque "reserves" (whatever they may be) requires calibrating *every* truck engine's computer control unit in a way that "minimizes the advantage of Atkinson [mode]." 87 Fed. Reg. at 25,789. But NHTSA never explains *why* automakers must calibrate any pickup truck engine that way. *See Genuine Parts Co.*, 890 F.3d at 312. And even if the resulting efficiency

advantage is "less," the agency never explains *how much* less and why the remaining advantage is not still beneficial. *Cf. Tripoli Rocketry*, 437 F.3d at 81 (an "unbounded relational definition" is arbitrary).

Equally important, the agency does not explain why *every* pickup's engine requires such an inefficient calibration. *See NRDC v. Herrington*, 768 F.2d 1355, 1396–1398 (D.C. Cir. 1985) (agency may not support categorical assumptions by referencing "general and unelaborated" concerns). Most pickups only tow something "one time a year or less," 87 Fed. Reg. at 25,790, and NHTSA never explains why all these trucks must be calibrated as if they are towing things the other 364 days as well. An Atkinson-enabled engine runs efficiently the majority of the time, and automatically switches to "power" mode only when needed. 87 Fed. Reg. at 25,786. Nor does the agency explain why, even if *some* trucks might need calibrations designed for frequent towing, it could not simply have assumed that efficiently calibrated Atkinson engines could spread to the rest of the fleet. *Cf.* 87 Fed. Reg. at 25,789 ("capacity limits" used to cap other technologies at certain levels of adoption in the model). NHTSA may not conclude that "all" applications of a technology are infeasible "merely by asserting that

many or even *most*" might be infeasible. *See Herrington*, 768 F.2d at 1397.

Not only was the agency's explanation non-existent, its conclusion that all pickups require highly inefficient calibrations is contrary to the record. The agency's only cited evidence was confidential "conversation" with an unknown number of unidentified automakers who the agency said "saw no benefit" to using Atkinson technologies on trucks. 87 Fed. Reg. at 25,789 n.233. But that is not substantial evidence. *See, e.g.*, *Flyers Rts. Educ. Fund*, 864 F.3d at 745–748. An agency "may decline to include confidential business information in the public administrative record in certain narrow situations," but it must disclose "as much information publicly as it can." *Id*. at 745. And the information disclosed must be sufficient to provide a reviewing court with a complete factual basis for the agency's decision. "An agency decision based on reliable data reposing in the agency's files but hidden from judicial view simply cannot withstand scrutiny." *Id.* at 746 (cleaned up).

Here, NHTSA discloses nothing from its confidential "conversation" that approaches a sufficient factual basis for the exclusion. As an initial matter, it is unclear why any automaker's identity would be

confidential. The identity of automakers using Atkinson technologies is public, as is the fuel economy of their marketed vehicles. *See* www.fueleconomy.gov. But even assuming the identities are confidential, NHTSA provides no information about what data (if any) the automaker(s) provided. And the statement that an automaker "saw no benefit" simply begs the question: "Compared to what?" As NHTSA stresses elsewhere, technology effectiveness "often differs significantly depending on the vehicle type" "and the way in which the technology interacts with other technologies on the vehicle." 87 Fed. Reg. at 25,765. Without information about what was being compared, it is not possible to assess the validity of the "no benefits" assertion.

NHTSA also does not specify how many automakers it spoke to. If it was only one or two, the agency would be contradicting its position that it does not base standards on the capabilities of individual automakers. *See, e.g.*, *id.* at 25,969. And it is implausible that NHTSA is recounting the views of every automaker that has deployed Atkinson technologies on light trucks. As the agency itself notes, these are "sophisticated, for-profit enterprises" who look before they leap. *See, e.g.*, *id.* at 25,721, 25,976. It beggars belief that all of these automakers

would invest in designing and mass producing these engines without confidence that they provide some "benefits."

Light trucks come in all shapes and sizes, and NHTSA stresses that vehicle efficiency is a "complex" product of all the various technologies on the vehicle. *Id.* at 25,765. Just because one automaker chose to calibrate a particular truck one way does not mean it had to do so. Nor does the behavior of one automaker say anything about whether another automaker would have to calibrate a different truck in the same way. *Cf.* JA___[NHTSA–2021–0053–1521–A2_4–9] (describing reduced-weight Ford F-150 with all-aluminum construction).

Moreover, even assuming the agency received actual data from an automaker, NHTSA cannot rely on it "without ascertaining the accuracy of the data" or "the methodology used" to generate it. *City of New Orleans v. S.E.C.*, 969 F.2d 1163, 1167 (D.C. Cir. 1992). Failure to do so "is arbitrary agency action" and findings based on that data "are unsupported by substantial evidence." *Id.* As far as NHTSA has disclosed, the agency blindly relied on an automaker's statement. Any such reliance was arbitrary. *See In re NTE Connecticut, LLC*, 26 F.4th at 988-989 (To rely on outside analysis, "[a]n agency must either

critically review [a] third party's analysis or perform its own," even where "a matter implicates confidential information.") (cleaned up).

In contrast, commenters provided public data showing that pickup engines are sized to handle higher "peak" loads than engines in other vehicle types, and therefore operate at a *lower* load relative to their capacity the rest of the time. 87 Fed. Reg. at 25,790. As a result, given the data that pickups rarely operate near peak load, this means that pickups "will spend more time in Atkinson [mode] . . . not less." *Id.* Because the efficiency gain in a vehicle employing an Atkinson-enabled engine is "directly related" to the time spent in Atkinson mode, *id.* at 25,786, the only reasonable conclusion is that pickups will see improved efficiency using properly calibrated Atkinson-enabled engines.

The agency never disputes this data. In response to it, the agency points only to three comments submitted by automakers in the *prior* round of fuel economy rulemaking in 2018. Tellingly, NHTSA does not cite any automaker comment from the *current* rulemaking supporting its new rationale. None of the 2018 comments provide any relevant data on duty cycles, torque reserves, or engine calibrations. Further, while the agency says Toyota's 2018 comment "exemplifie[s]" the agency's

position in this rulemaking, 87 Fed. Reg. at 25,790, the agency quotes selectively. NHTSA omits preceding sentences that make clear Toyota was urging regulators not to expect the Tacoma pickup equipped with one Atkinson engine to achieve the same efficiency as a Camry sedan equipped with a different Atkinson engine. JA___[NHTSA–2018–0067–12376–A1_6–7]. That says nothing about whether the Tacoma can benefit from an Atkinson-enabled engine. Indeed, Toyota has marketed the Atkinson-enabled Tacoma for the past seven years.[13]

In short, the record shows that automakers can improve pickup truck fuel economy using Atkinson technologies. NHTSA "has failed to offer [a] rational connection between [the record] facts" and its conclusion that the technology is infeasible for use on pickups. *State Farm*, 463 U.S. at 56. The agency's decision to set standards in reliance on modeling that excluded this technology was arbitrary. *Id.*

[13] *See, e.g.*, Toyota, *2023 Tacoma SR*, https://www.toyota.com/configurator/build/step/model:engine-drive-transmission/year/2023/series/tacoma/model/7594/ (2023 Tacoma SR with 3.5 liter, 6-cylinder Atkinson-cycle engine) (visited Nov. 17, 2022).

B. The agency arbitrarily extended the pickup truck exclusion to a million sport utility vehicles and cars

Even if the record supported the assumption that pickups cannot be made more efficient with Atkinson technologies, there is no rational basis for NHTSA to extend that assumption to the more than one million sport utility vehicles and cars sold each year[14] that share an engine with a pickup truck. *See* 87 Fed. Reg. at 25,789. The agency justifies the pickup exclusion based on the engine calibration supposedly needed for a truck's duty cycle. But NHTSA does not explain or justify why all the excluded sport utility vehicles and cars would require the same calibration. The extension is thus arbitrary and capricious. *See Genuine Parts Co.*, 890 F.3d at 312.

As with pickups, *see* Section I.A *supra*, there is no record evidence that the excluded sport utility vehicles and cars have "duty cycles" so extreme that it is infeasible for automakers to install Atkinson-enabled engines. Indeed, for virtually every type of vehicle that NHTSA assumes cannot adopt this technology, there is a real-world example on the road today that uses it. Sport utility vehicles using Atkinson

[14] JA___[Model_Files] (Central_Analysis/input/market_data_ref.xlsx, Vehicles_tab, Columns V, H, Y, Engines_tab, Columns C, H, AD–AF).

engines range from larger six-cylinder models like the Hyundai Palisade and Kia Telluride, 87 Fed. Reg. at 25,789 n.230, to "performance" models like the Toyota Highlander.[15] Blocking other new vehicles of this type from receiving Atkinson engines in the compliance model thus runs counter to the real-world evidence that such applications are feasible.

NHTSA may argue, post hoc, that there is an economic justification for extending the exclusion to these vehicles. Elsewhere, the agency describes cross-vehicle engine sharing as a cost-saving measure. *See* 87 Fed. Reg. at 25,760. But the agency did not articulate this as the reason for extending the Atkinson technology exclusion to non-pickups, and its decision cannot be upheld on that basis now. *State Farm*, 463 U.S. at 50 ("post hoc rationalizations for agency action" carry no weight).

Such an argument would fail in any event, because the record does not support it. First, when an automaker uses the same engine in multiple vehicles, the agency assumes that automakers will upgrade the engine on the vehicle that is the sales "leader" first, before

[15] JA___[Model_Files] (Central_Analysis/input/market_data_ref.xlsx, Vehicles_tab, Rows 1269–1270, Column H).

upgrading the engine on the "follower" vehicles. 87 Fed. Reg. at 25,787. If so, that approach might make fleet upgrades *more* economically practicable overall. But it does not follow that upgrading a "follower" vehicle first is economically *im*practicable. 49 U.S.C. § 32902(f) (agency must consider "economic[ally] practicab[le]" options). Yet NHTSA would have to categorically assume that it is.

The lack of record evidence that it is economically impracticable to upgrade a "follower" sport utility vehicle first is particularly problematic here. The agency's compliance model will only select Atkinson technology for a sport utility vehicle if it is the *most* cost-effective option available. JA___[CAFE_Model_Documentation_75_fig. 8]. In other words, NHTSA's extension of the pickup exclusion blocks the most cost-effective upgrades, and does so based on an unstated, unsupported, categorical assumption that they are economically impracticable. NHTSA's choice to do so is arbitrary and lacking a reasoned explanation.

Further, many sport utility vehicles *are* the "leader" vehicle for a shared engine. For example, General Motors shares an engine across five different vehicle nameplates: two pickups (the Canyon and the

Colorado) and three sport utility vehicles (the Blazer, the Acadia, and the Envision).[16] But the Envision alone outsells both pickups combined, and the sport utility vehicles together outsell the pickups together nearly three to one.[17] There is no rational reason to block cost-effective Atkinson upgrades to the better-selling sport utility vehicles just because they share an engine with the worse-selling pickups.

In short, NHTSA's categorical assumption that Atkinson upgrades are infeasible on any vehicle that shares an engine with a pickup truck is unexplained and unsupported. It is thus arbitrary.

C. NHTSA erroneously blocked Atkinson upgrades on half a million more vehicles than intended

The agency committed at least two different coding errors that caused its model to skip consideration of Atkinson technologies on even more vehicles than the agency intended to exclude. In other words, these errors block cost-effective Atkinson upgrades even where the agency says they should be allowed. These errors, affecting half a million vehicles sold each year, further exaggerated the already inflated

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[16] JA__ [Model_Files] (Central_Analysis/input/market_data_ref.xlsx, Engines_tab, Row 3, Vehicles_tab, filter Column H=112501).

[17] JA__ [Model_Files] (Central_Analysis/input/market_data_ref.xlsx, Vehicles_tab, filter Column H=112501, compare Column V).

costs that NHTSA attributed to more stringent standards. The agency's decision to rely on such faulty modeling is arbitrary, even if the agency's intended exclusions of pickups and sport utility vehicles could be justified. *But see* Section I.A–B *supra*. There is no possible "rational connection" between the agency's finding that the model *should* allow some vehicles to upgrade to Atkinson engines and the agency's error in blocking those upgrades. *See State Farm*, 463 U.S. at 56.

First, the agency arbitrarily blocked more than 440,000 General Motors vehicles from adopting Atkinson technologies in its modeling.[18] These blocked vehicles meet none of the criteria the agency says renders the use of Atkinson-enabled engines infeasible. *Cf.* 87 Fed. Reg. at 25,789.[19]

Second, NHTSA erroneously blocked Atkinson upgrades on another 144,000 vehicles with less than 405 horsepower based on the agency's

[18] JA___[Model_Files] (Central_Analysis/input/market_data_ref.xlsx, Vehicles_tab, filter Column H=113601 and 113602).

[19] The error also arbitrarily blocks these vehicles from adopting hybrid Atkinson technologies as well. *Compare* 87 Fed. Reg. at 25,812, *with* JA___[Model_Files] (Central_Analysis/input/market_data_ref.xlsx, Vehicles_tab, *e.g.*, Row 5, Columns BU–BX, CC–CD).

high-horsepower exclusion.[20] The agency states that it does "not allow *vehicles* with 405 or more horsepower" to adopt Atkinson engines." 87 Fed. Reg. at 25,789 (emphasis added). But NHTSA blocked Atkinson upgrades in vehicles with *less* than 405 horsepower. This appears to be an implementation error, whereby if the *engine* in the less-than-405-horsepower vehicle is used in a different vehicle with more than 405 horsepower, the agency erroneously blocked the less-than-405-horsepower vehicle in the compliance model. As the agency explains elsewhere, an engine's horsepower can be "significantly different" based on the vehicle in which it is installed. 87 Fed. Reg. at 25,787. The excluded lower horsepower *vehicles* do not meet the stated criterion and it was arbitrary for the agency to block them in the model.

II. Remand Without Vacatur Is the Appropriate Remedy

This Court should grant NRDC's petition and remand the Final Rule to the agency without vacatur. Although vacatur is typically the remedy for arbitrary and capricious agency action, *see Bhd. Of*

[20] JA___[Model_Files] (Central_Analysis/input/market_data_ref.xlsx, Vehicles_tab/Engines_tab, filter for HCR-blocked vehicles, eliminate vehicles blocked for reasons other than horsepower; read Vehicles_tab Column BA).

Locomotive Eng'rs & Trainmen v. Fed. R.R. Admin., 972 F.3d 83, 117 (D.C. Cir. 2020), remand without vacatur is appropriate where a petitioner challenges a regulatory standard as too lax, and vacatur would result in either no standard or a laxer standard springing into place. *See, e.g., Wisconsin v. EPA*, 938 F.3d 303, 336–337 (D.C. Cir. 2019); *Envtl. Def. Fund v. EPA*, 898 F.2d 183, 190 (D.C. Cir 1990).

For example, in *U.S. Sugar Corp. v. EPA*, public interest groups successfully challenged an agency action establishing insufficient standards for pollution from industrial boilers. *See* 844 F.3d 268, 270 (D.C. Cir. 2016). Because vacating the standards would have removed the limited protection of the insufficient standards and allowed greater pollution until the agency "complete[d] another rulemaking and implement[ed] replacement standards," this Court remanded without vacatur to avoid "defeat[ing] . . . the enhanced protection" sought by petitioners. *Id.* (quotations omitted); *see also North Carolina v. EPA*, 550 F.3d 1176, 1178 (D.C. Cir. 2008). In general, this Court does not vacate regulations where doing so would undermine the public's interest in the enhanced protection the regulations were supposed to provide. *Wisconsin*, 938 F.3d at 336–337.

Congress has made the policy choice that "maximum feasible" fuel economy standards are in the public interest. 49 U.S.C. § 32902(a). Although the standards challenged here are not the maximum feasible, vacating them would, at least temporarily, leave laxer standards in place. That result would undermine the statute's "overarching goal of fuel conservation," *Ctr. for Auto Safety*, 793 F.2d at 1340 (1986), and leave petitioner NRDC and its members worse off than under the Final Rule. *See, e.g.*, 87 Fed. Reg. at 26,004 (more stringent standards reduce fuel consumption, achieve greater reductions in climate pollution, and save consumers more in fuel costs). Accordingly, the Court should remand the Final Rule to the agency without vacatur.

CONCLUSION

This Court should remand the Final Rule, without vacatur, for the agency to correct its errors regarding the exclusion of Atkinson-enabled engines and to reconsider the feasibility of more stringent standards.

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Respectfully submitted,

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Natural Resources Defense Council

CERTIFICATE OF COMPLIANCE

I hereby certify that the foregoing brief was composed in 14-point Century Schoolbook font and complies with applicable typeface and type-style requirements. The brief contains 9,371 words and complies with the type-volume limitations of this Court's order of September 22, 2022. ECF No. 1965625.

/s/ *Pete Huffman*
Pete Huffman

Dated: November 17, 2022

CERTIFICATE OF SERVICE

I hereby certify that on November 17, 2022, I filed the foregoing brief and attachments on all parties through the Court's electronic case filing (ECF) system.

/s/ *Pete Huffman*
Pete Huffman